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(54) Cleaning system and process for making same employing reduced air cleaning fabric

Reinigungssystem und Verfahren zu dessen Herstellung unter Verwendung eines Reinigungstuchs
mit beschränktem Luftvolumen

Dispositif de nettoyage utilisant un système de nettoyage avec une quantité d'air réduite et procédé
pour sa fabrication

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Descripti n

[0001] The present invention relates to a packaged cleaning device for a cylinder of a printing press.

[0002] A wide variety of blanket cleaning systems and apparatus employing the same to clean the cylinders of printing press are known. Typical blanket cleaning systems and apparatus employing the same, including cleaning blankets and cleaning solutions, are exemplified by U.S. Patent No. 4,135,448 to Moestue which is directed to a mechanism for cleaning a cylinder that is provided with a cleaning cloth which is wetted with a cleaning fluid or solution prior to its encountering the pressure roller; U.S. Patent No. 4,934,391 to Futch et al. is directed to a composition for ink removal that exhibits a low vapor pressure and which is a low vapor pressure organic compound; U.S. Patent No. 4,986,182 to Sawaguchi et al. is directed to a cleaning apparatus in which a cleaning cloth is dampened by a liquid; U.S. Patent No. 5,009,716 to Gerson is directed to a wash for removing ink comprising a low volatile organic compound; U.S. Patent No. 5,012,739 to Loos is directed to a washing device comprising a cleaning cloth dampened with a washing medium and U.S. Patent No. 5,069,128 to Hara is directed to a device for cleaning a cylinder of a printing machine comprising a cleaning cloth impregnated with a cleaning liquid.

[0003] In addition, U.S. Patent No. 5,104,567 to Staehr is directed to a liquid for cleaning ink from printing machines; U.S. Patent No. 5,125,342 to Hara is directed to a method for cleaning the cylinder of a printing machine; and U.S. Patent No. 5,143,639 to Krawack is directed to a cloth moistened with a low vapor pressure cleaning agent for removing ink; whereas U.S. Patent No. 5,188,754 to Weltman et al. is directed to a cloth soaked with a cleaning formula and U.S. Patent No. 5,194,173 to Folkard et al. is directed to a method for removing ink from printing machines. Still further, U.S. Patent No. 4,344,361 and 4,757,763 to MacPhee et al. is directed to automatic blanket cylinder cleaners provided with cleaning fabrics adapted to contact the blanket cylinders of printing presses. On the other hand, U.S. Patent No. 5,175,080 to Gasparrini et al. is directed to a cloth supply system for the blanket cylinder for use in printing presses.

[0004] Still further, U.S. Patent No. 5,320,217 to Lenarz is directed to a sealed envelope which contains a moistened pad that functions as a swab. The pad is secured to the envelope by an intermediate line seal. Consequently, when the top of the envelope is removed, the pad is exposed. Since the pad is still captively held to the remainder of the envelope, the liquid on the pad may be dispensed by holding the clean, dry, bottom of the envelope. Thus, the pad functions as a swab and the remainder of the envelope functions as the applicator and the reservoir. Alternatively, U.S. Patent No. 4,998,984 to McClendon is directed to a pre-packaged single use disposable wiper pad or towelett that is sat-

urated with a disinfecting liquid and the pad is effective to disinfect inanimate surfaces. The pad is of a size which fits into a pocket or purse and makes it convenient to carry, while posing no problem in disposing of the same, such as by flushing in a toilet.

[0005] U.S. Patent No. 4,679,724 to Inagaki is directed to a water-proof container having a cylindrical base member made of paper which is surrounded by a double-wall heat-shrinkable plastic film covering the paper base member and having at least one portion heat-sealed to close the paper base member entirely within the plastic film and lid connected to the base member for closing at least one open end of a container shape formed by the paper base member.

[0006] U.S. Patent No. 4,467,916 to Hedden et al. is directed to a package of wound glass fiber strand from which the glass fiber strands can be removed more efficiently for feeding into processing operations. The wound package of glass fiber strands is a package of

superimposed annular layers of glass fiber strands having a central longitudinal, cylindrical cavity about which the strands are wound and having an outer cylindrical surface and a substantially flat circular top and bottom section. The package is covered with a stretchable polymeric film and at least one free end of the glass fiber strand extends into the central cavity for removal from the interior to the exterior of the package.

U.S. Patent No. 4,295,563 to Becker et al. is directed to an article of manufacture comprising a hollow rod of longitudinally gathered tubes of cellulose hydrate-based materials the hollow rod having a latent water content of between about 25% and 100% by weight based on the total weight of the hollow rod and being free of chemical antibacteriocidal agent; a closed, substantially gas impermeable packaging sheath having a hollow interior chamber therein and in which the hollow rod is positioned so that this rod is completely enveloped by the packaging sheath which is made of a flexible film of material that is substantially impermeable to gases; and a protective gas essentially fills the remaining portion of the hollow interior chamber of the sheath so that the gas protects the hollow rod against the formulation of aerobic microorganisms on the water-containing cellulose hydrate material.

[0007] Still further, U.S. Patent No. 3,980,176 to Boggs is directed to a high speed yarn take-up system which consists of a pneumatic injector nozzle rotably mounted off-center of a single fluted rotating screw. Yarn is injected into the area exposed at the trailing edge of the screw and compressed and moved forward in a compression chamber by the feeding of the screw. A plastic tube is continuously formed around the compression chamber to receive the yarn mass as it discharges, thus forming a tube of indefinite unlimited length and from 1/4 to 4 inches or larger in diameter. The tube may contain a single end or multiple ends of yarn which may be removed from the tube at high speed by simply slitting the plastic as the yarn is pulled from the package.

Alternatively, U.S. Patent No. 3,850,294 to Phillips et al. is directed to a package of roving unsized continuous filaments of glass, the package being saturated with water which maintains the filaments in group orientation.

[0008] U.S. Patent No. 3,014,579 to Lathorp is directed to a disposable cleaning device which consists of a capsule containing a plurality of applicators and which may be employed in many and various uses. The applicators enclosed within the capsule comprise a central core of sponge or sponge rubber having a wad or pad of absorbent material, such as cotton or the like, wrapped around the core. The core is saturated with suitable material and the cotton wrap, for example, provides a vehicle through which the material in the sponge rubber core is absorbed from the core and applied to a given usage.

[0009] Still further, U.S. Patent No. 2,189,556 to Younghusband is directed to a pipe cleaner formed with a pliable metal member, such as a spindle or length of wire or the like. Attached to that member and extending through at its length are tufts of fabric or other material capable of absorbing liquid. These tufts are impregnated or saturated with a liquid solvent solution and the impregnating pipe cleaners are then packed in a container and sealed to prevent evaporation.

[0010] While the above-mentioned patents accomplish their purposes to a satisfactory extent, they still exhibit a variety of drawbacks. For example, they usually require apparatus, such as pumps, spray bars, manifold lines, valves, and the like as part of the automatic blanket cleaning systems for introducing the cleaning solvents or solutions to the cleaning fabric just prior to actual use. Moreover, even in these cases, where the cleaning rolls or fabric rolls are presoaked or pre-wetted, the pre-soaking or pre-wetting, must be accomplished just before use in order to minimize loss of cleaning solvent or solution in order to provide an effective cylinder cleaning system.

[0011] U.S. Patent No. 5,368,157 to Gasparrini et al., the present applicants, attempted to overcome these problems. That patent is directed to a pre-packaged, pre-soaked cleaning system for use with printing machines or the like to clean the cylinders of such machines and which comprises a pre-soaked fabric roll saturated to functional equilibrium with low volatility organic compound solvent and which is disposed around an elongated, cylindrical core and enclosed in a sealed sleeve which if desired may be a heat-sealed or a heat-shrunk and heat-sealed plastic sleeve disposed around and intimate contact with the fabric roll, whereby the pre-soaked saturated fabric roll can be transported and stored vertically and/or horizontally until use without substantially disturbing the distribution of the solvent in the fabric roll and detrimentally effecting the cleaning ability of the fabric.

[0012] While the invention disclosed in U.S. Patent No. 5,368,157 works for its intended purpose, improvements have been discovered. When the patented prod-

uct is placed in the vertical position, the solvent would shift downward in the evacuated package. When the package is restored to the horizontal position, the solvent migrates back towards equilibrium in the roll. This migration is caused by air pockets in the fabric of the roll that have not been completely evacuated.

[0013] There exists, therefore, a need for providing a pre-packaged, pre-soaked blanket cleaning system which minimises the above-mentioned disadvantages and drawbacks. The present invention fulfils such a need.

[0014] According to the present invention there is provided a packaged cleaning device for a cylinder of a printing press comprising a roll of porous sheet material impregnated with a cleaning liquid in a closed container, wherein the sheet material has been mechanically compressed prior to impregnation with the cleaning liquid, so as to reduce its air content.

[0015] The sheet material may be wrapped around a core. The length of the sheet material may be at least about 25% greater than the length of non-air reduced sheet material having an equal diameter about the core. The core may comprise an elongate cylinder having open ends, the device further comprising end caps located in the open ends of the core.

[0016] The cleaning liquid may be present in the sheet material in an amount sufficient to saturate the sheet material to functional equilibrium and the saturated sheet material may be functional for cleaning the cylinders of a printing press. The sheet material may be a cloth fabric or it may comprise a mixture of wood pulp and polyester. The thickness of the sheet material may have been reduced by between about 10% to about 50%. The sheet material may have a reduced air content by volume by about 1% to about 50%. The sheet material may retain from about 30 to 800cc per square metre (0.02 to about 0.5 cc of the cleaning fluid per square inch) of the sheet material.

[0017] The cleaning liquid may comprise at least one low volatility cleaning compound which does not readily evaporate at ambient temperature and pressure and may have a volatility in a range of from about zero to about 30%.

[0018] The container may comprise a sealed sleeve disposed around and in contact with the sheet material, whereby the sheet material can be transported and stored vertically and horizontally until use without substantially disturbing the distribution of the solvent in the fabric and detrimentally affecting the cleaning ability of the sheet material. The sealed sleeve may be made of heat-sealable plastic material and may be heat-shrinkable. The sleeve may be made of polyethylene, polyolefin, polyvinyl chloride or polyamide sheet material.

[0019] The device may further comprise a canister disposed between the sheet material and the sleeve. The device may further comprise a means for positioning the sheet material adjacent to a cylinder to be cleaned.

[0020] According to the present invention there is also provided a method of making a packaged device for cleaning a printing cylinder, comprising pre-soaking and saturating a porous sheet material with a low-volatility, organic compound solvent which does not evaporate readily at ambient temperature and pressure, forming a roll of the pre-soaked material, and packaging the roll in a closed container wherein compressing the sheet material, prior to the pre-soaking so as to reduce its air content.

[0021] The step of packaging may include the step of sealing the container around the roll, whereby the roll can be transported and stored vertically and horizontally until use without substantially disturbing the distribution of the solvent in the sheet material roll and detrimentally affecting the cleaning ability of the sheet material. The step of packaging may comprises placing a sealable sleeve around the wrapped, saturated sheet material roll and sealing the sealable sleeve around the wrapped, saturated sheet material roll. The method may further comprise subjecting the sealable sleeve to a vacuum and drawing the sealable sleeve into contact with the wrapped sheet material roll after disposing the wrapped sheet material roll in the sealable sleeve and before sealing the sleeve. The strip of sheet material may be wrapped about an elongate core prior to soaking the strip of sheet material with the solvent.

[0022] The step of pre-soaking the strip may comprise saturating the sheet material beyond equilibrium with excess solvent and removing the solvent so that the sheet material is in functional equilibrium. The step of pre-soaking the strip may comprise bringing a measured amount of the solvent in contact with the strip of sheet material and allowing the measured amount of solvent to be absorbed. The solvent may be removed until the sheet material retains about 30 to 800 cm³ per m² (0.02 to about 0.5 cc of solvent per square inch) of the sheet material.

[0023] The step of reducing the amount of air may comprise calendaring the sheet material and may include increasing the length of the sheet material by at least about 25%. The step of reducing the amount of air may be accomplished by reducing the thickness of the sheet material by between about 10% to about 50%. The method may include reducing the air content in the sheet material by between 1% to 50%.

[0024] The method may further comprise the steps of unwinding at least a portion of the sheet material from the sheet material roll, placing said at least a portion of the sheet material in contact with a cylinder to be cleaned and taking-up said at least a portion of the sheet material on a take-up shaft.

[0025] Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings in which:-

Figure 1 is a lateral, sectional, elevational view of a cleaning system employing a reduced volume of air

in cleaning fabric according to the invention; Figure 2 is a lateral, sectional, elevational view of the system shown in Figure 1, including the disposition of the pre-soaked, wrapped roll in a slotted canister before it is inserted in the sealable sleeve and/or sealable and shrinkable sleeve shown in Figure 1;

Figure 3 is a partial, sectional, elevational, diagrammatic view of the system shown in Figure 1 employing end caps disposed in the open ends of the elongated core and extending over the peripheral edges of the fabric roll;

Figure 4 is a sectional view of a fabric undergoing calendaring; and

FIG. 5 is a partial cross-sectional view of a cylinder to be cleaned and a pre-soaked cleaning system employing a reduced volume of air in fabric according to the present invention.

[0026] Referring now to FIG. 1, a cleaning system employing a reduced volume of air in cleaning fabric with a longer length but not an increased diameter according to the present invention comprises an elongated core 11 made from, for example, relatively heavy cardboard

25 of sufficient strength so that it can support thereon a pre-soaked fabric roll 13. Additionally, if desired, the core 11 can be made from any other suitable material including, but not limited to, plastic or metal, such as steel, aluminum, and the like. Core 11 may have open ends to allow engagement on an appropriate machine. Core 11 may also be a shaft. Preferably, as shown in FIG. 2, core 11 is completely hollow to allow a shaft, rod, or the like 21 to be inserted within core 11 to provide engagement. The core 11 is also preferably provided with engagement means (not shown), for reception of a shaft 21 located on an appropriate machine (not shown), such as a printing machine or the like, provided with a take-up shaft 52 to take-up the cleaning fabric after it has achieved its cleaning function. Alternatively, shaft 21

30 may be equipped with engagement means (not shown) for engagement of a core 11. Preferably, the core 11 is cylindrical in shape. However, the core 11 may be any other appropriate shape.

[0027] The machine further includes a means for 35 properly positioning the cleaning fabric to allow cleaning of the cylinder. Several ways exist for this result to be achieved. For example, the cleaning fabric 54 may be positioned so that it is adjacent the cylinder 56 to be cleaned. In another example, the cleaning fabric 54 may

40 be adjacent to and operatively associated with the cylinder 56 to be cleaned. In yet another possible embodiment, the cleaning fabric 54 is operatively associated with the cylinder 56 to clean the cylinder 56 as the fabric 54 is in contact with and fed past the cylinder 56. One 45 possible arrangement is shown in Fig. 5. The person of ordinary skill in the art will be aware of many other configurations that will work for the invention's intended purpose without undue experimentation. These examples

are merely exemplary and are not meant to limit how the invention may be used.

[0028] The fabric is presoaked and saturated with a low volatility organic compound solvent, as described in more detail hereinbelow, before or after it is wrapped around the core 11 to form roll 13 in any convenient matter. Solvent is applied in measured amounts so that the fabric is presoaked to functional equilibrium. The preferred method of applying solvent is measured absorption of solvent. If desired, an excess amount of solvent can be applied and the excess solvent drained or spun off to obtain functional equilibrium rather than the use of measured absorption. In a preferred embodiment, the roll 13 is then inserted into a sealable sleeve 15 which is to be sealed in any convenient and appropriate matter. Preferably, sleeve 15 is made of heat-sealable or heat-sealable and shrinkable plastic material which is heat-sealed along its edge 17 or shrunken and heat-sealed along its edge 17. The sealing of sealable sleeve 15 preferably places sleeve 15 in intimate contact with fabric roll 13.

[0029] In the modified embodiment of the invention illustrated in FIG. 2, the pre-soaked fabric roll is inserted in a sleeve or canister 23, provided with a slit 25 through which a portion of the fabric roll 13 can be withdrawn before the assembly is sealed in the sleeve.

[0030] In yet another modified embodiment, as shown in FIG. 3, the system of this invention is also preferably provided with end caps, such as end cap 25, made of plastic or metal or like material disposed in the open ends of the core 11. The end caps extend over the peripheral edges of the fabric roll 13 and the sleeve 15 may extend, as shown, over the edges of the end caps or it may extend completely around the ends of the roll 13 as shown in FIG. 1. Obviously, when a slotted canister 23 is employed end caps need not necessarily be used. Moreover, it is to be understood that it is within the purview of this invention that the sleeve is sized conveniently to accommodate the roll to be covered thereby and to be drawn or shrunken into intimate contact with the roll and sealed, as needed, whether it be open at both ends or at one end only.

[0031] The fabric from which the fabric roll is made may vary widely. For example, it may be made of paper, cloth, film, a mixture of wood pulp and polyester, such as DuPont SONTARA, or any other suitable material. In those cases where a cloth fabric is employed, it may be a woven or non-woven cloth fabric made of synthetic or natural fibers or mixtures of the same. Exemplative, but not limitative, of suitable synthetic fibers which may be used in the cloth fabrics are polyester fibers, rayon fibers, nylon fibers, and acrylic fibers and the like. Exemplative, but not limitative, of the natural fibers which may be employed are cotton fibers, wood pulp fiber, hemp fibers and the like.

[0032] In those cases where paper is employed as the fabric material, paper fabrics made from wood pulp modified chemically in accordance with paper manufac-

turing technology are suitable.

[0033] On the other hand, no matter what fabric is employed in carrying out the practice of this invention, it is preferred that the materials used therein exhibit high acceptability to being soaked or wetted by a solvent. Preferably, this solvent is a low volatility organic compound solvent used to saturate the fabric. In this regard, it is preferred that the fabric employed be one which has a caliper thickness in a range from about 0.003 inches to about 0.030 inches, and preferably in a range from about 0.007 inches to about 0.020 inches, and the ability, when saturated with low volatility organic compound solvent, to retain from about 0.02 cc to about 0.5 cc of solvent per in² of fabric determined by routine testing methods.

[0034] In general, woven and non-woven fabrics suitable for use in carrying out the practice of the invention have a basic weight in a range of from about 1.5 ounces per square yard to about 6.0 ounces per square yard, a caliper thickness in the range mentioned above, a tensile strength in the longitudinal (machine) direction in a range of from about 20 lbs. per inch to about 200 lbs. per inch and in a width (cross) direction in a range from about 15 lbs. per inch to about 125 lbs. per inch.

[0035] When paper is employed as a cleaning fabric in the system of this invention, it preferably has a basic weight in a range of from about 40 lbs. to about 90 lbs., a caliper thickness in a range of from about 0.003 inches to about 0.010 inches, a tensile strength in the longitudinal (machine) direction in a range of from about 20 lbs. per inch to about 80 lbs. per inch and in the width (cross) direction in a range of from about 15 lbs. per inch to about 50 lbs. per inch, a porosity in a range of from about 1.0 second to about 10 seconds when subjected to 100 cc of low volatility organic compound solvent or water, and a stretch ability in a range of from about 1.0 percent to about 6.0 percent all determined by routine testing methods.

[0036] Regardless of the type of material used as the cleaning fabric, the fabric must have a low air content. In one embodiment, all of the air is removed from the fabric. In another embodiment, between about 1% and about 50% of the air is removed. One method of accomplishing this reduced air content is to start with a fabric with substantially no or little air content. Alternatively, if the fabric initially has a substantial air content, this air content can be removed from the fabric to produce a reduced air content fabric. The reduced air content provides for an absorptive solvent amount and a reduced displacement of solvent during storage and thus less of a shift or no shift in the fabric roll's center of gravity and allows for better and more even distribution of the solvent within the fabric roll 13.

[0037] The preferred, but not exclusive, method of reducing the air content in the fabric is calendering. Calendering is demonstrated in FIG. 4. A fabric 41 is calenderized by running it through at least a pair of rollers 42. The at least a pair of rollers 42 compress the fabric.

Preferably, but not necessarily, the temperature of the at least a pair of rollers 42 is hotter than room temperature. Alternatively, the temperature of the at least a pair of rollers 42 is at about ambient temperature or less than ambient temperature. It has been found that the wettability and the distribution of the solvent is very good in the calenderized fabric.

[0038] The amount of calendering necessary to remove the air from the fabric is dependent on the fabric. For example, if standard cloth of 0.012 inches is used, such as DuPont's SONTARA, it is preferred that the fabric is calendered to reduce its thickness to about 0.0085 inches. This reduces the air content in the cloth by about 30%.

[0039] A surprising and unexpected result of the calendering process is that the length of fabric is increased while not increasing the diameter of the fabric roll 13. This provides an important advantage because cleaners are designed to accept fabric rolls of up to a certain diameter. For example, one of the Applicant's automatic blanket cleaners will only accept a cleaning fabric roll having a diameter of about 2.75 inches. Because of this extra length, a fabric roll of calenderized cloth will be usable for more washes than a regular fabric roll of the same fabric having the same diameter. This has two advantages. First, the cost per wash will be reduced. Second, the pressmen need not change a roll of cleaning fabric as often since there are more washes per roll of cloth. This will allow for the press to be run more often. These advantages can be realized regardless of whether the fabric is pre-soaked and/or pre-packaged.

[0040] The amount of increase in the length of cloth due to calendering is dependent on the fabric used and the amount of calendering. For example when DuPont SONTARA cloth having a thickness of about .012 inches and a length of about 12 yards is placed about a core, having a diameter of about 1.5 inches, the fabric roll has a diameter of 2.75 inches. After being calendered the cloth has a thickness of about 0.0085 inches and a length of about 16 yards and still has a diameter of about 2.75 inches when placed on the same core. Thus, in this situation, calendering results in an about 25% to about 30% increase in the length of the fabric without increasing the diameter of fabric roll 13. Depending on the type of fabric and amount of calendering, results may range from about a 10% increase to about a 50% increase.

[0041] The low volatility organic compound solvent employed in carrying out the practice of this invention may vary widely and generally it includes at least one low volatility, organic compound solvent which does not readily evaporate at ambient temperature and pressure, as well as mixtures of the same with similar low volatile organic compound solvents or with normally volatile organic compound solvents. Exemplative, but not limitative, of suitable solvent materials of this type are organic compound solvents selected from vegetable oils and citrus oils and the like. Generally, such solvent materials have a volatility in a range of from about zero up to about

30.0 percent, and preferably a volatility in a range of from about zero percent to about 20.0 percent, determined by routine testing methods. It is to be understood that within the purview of this invention, such suitable solvents also include normally volatile organic compound solvents, that is, those which readily evaporate and which are selected from mineral spirits and aliphatic hydrocarbon solvents and the like. Such solvent materials generally have a volatility of from zero up to about

10 100 percent determined by routine testing methods. Preferably, a low volatility solvent will be used because the lower the volatility of the solvent, the longer the fabric stays wet since less solvent evaporates. The closer the volatility is to zero percent, the longer the life of the presoaked fabric on the printing press.

[0042] For the embodiments involving heat-sealing and/or heat-sealing and shrinking, a wide variety of heat-sealable and/or shrinkable and heat-sealable plastic materials may be used for sealable sleeve 15. For example, the sleeve may be made from polyethylenes, polyolefins, polyvinyl chlorides, and polyamides and the like. Generally, such materials are heat-sealable and/or shrinkable and heat-sealable at a temperature in a range of from about 300° F. to about 400° F., and preferably in a range of from about 350° F. to about 375° F. Moreover, it is to be understood that within the purview of this invention, the heat-sealable and/or shrinkable and heat-sealable sleeve may be made from heat-sealable and/or shrinkable and heat-sealable paper.

[0043] The method of making a cleaning system employing a reduced air content cleaning fabric according to the invention comprises obtaining a strip of reduced air content cleaning fabric. For purposes of this invention, the term reduced air content cleaning fabric additionally encompasses a fabric having no or substantially

35 no air content. One method of obtaining a reduced air content cleaning fabric is to make or purchase a cleaning fabric with substantially little or no air content. Alternatively, a strip of fabric with a substantial air content

40 can have its air content reduced. Preferably, the method of reducing the air content of the fabric is calendering. The strip of reduced air content cleaning fabric is brought in contact with a low volatility, organic compound solvent which does not evaporate readily at ambient pressure and temperature and presoaking and saturating the cleaning fabric to functional equilibrium.

45 This is preferably done by measured absorption. Excess solvent, if any, may be removed from the cleaning fabric, preferably by draining or spinning the excess solvent, to obtain a fabric saturated to functional equilibrium with the solvent. The cleaning fabric is wrapped around an elongated core forming a fabric roll.

[0044] In one variation of the method, the fabric is preferably wrapped around the core prior to contacting 55 the same with the solvent. In yet another embodiment, the fabric is wrapped around the core after being saturated with the cleaning solvent. It is also within the invention to saturate the fabric with solvent both prior to

and after forming the fabric roll 13. The wrapping of the fabric can be done in any convenient manner and requires no special apparatus, a wide variety of roll making equipment being readily available for accomplishing the same.

[0045] In a preferred embodiment, the method further comprises the step of sealing the fabric roll so that it can be transported and stored vertically and horizontally until use without substantially disturbing the distribution of said solvent in said fabric roll and detrimentally affecting the cleaning ability of the fabric. The preferred, but not exclusive, method of sealing the fabric roll is the use of a sealable sleeve disposed around the fabric roll. The preferred type of sealable sleeve is a heat-sealable plastic sleeve around the wrapped fabric roll and placed in intimate contact with the fabric roll and subjecting the sleeve to a temperature sufficient to seal the plastic sleeve around the wrapped fabric roll. In order to use this type of sealant, the fabric roll is inserted in a heat-sealable and/or shrinkable and heat-sealable plastic sleeve and the sleeve is heat-sealed and/or heat-sealed and shrunken at any appropriate temperature around the roll in intimate contact therewith. Generally, temperatures in a range of from about 300°F to about 400°F, and preferably in a range from about 350°F to about 375°F, are used to accomplish the heat-sealing and/or heat-sealing and heat-shrinking of the saturated fabric roll in the plastic sleeve and bringing the sleeve into intimate contact with the fabric roll.

[0046] In a variation of the method, it is preferred, especially where a heat-sealable plastic sleeve is employed, that once the fabric roll is inserted in the sleeve, the so assembled sleeve and fabric roll be subjected to a vacuum which draws the heat-sealable plastic sleeve into intimate contact with the fabric roll, while at the same time exhausting any air from the interior of the sleeve, and then simply heat-sealing the sleeve around the roll by application of heat to the open peripheral edges of the sleeve. Known appropriate vacuum apparatus and heat-sealing apparatus may be used by simple adaption of the same physically to accomplish apparatus for applying the vacuum and heat-sealing of the sleeve.

[0047] On the other hand, when a sleeve employed in carrying out the method is both heat-sealable and shrinkable, then one or more small openings or vent holes (not shown) in the sleeve, preferably located near the open edges of the sleeve, are provided to permit exhaustion of air from the sleeve as heat-sealing and shrinking is accomplished, the location of such opening or openings assuring that any such opening or openings will be closed during the heat-sealing and heat-shrinking of the sleeve.

[0048] In accordance with the method of this invention, contact between the fabric strip and the solvent can be achieved in a variety of ways. For example, if desirable, the appropriate solvent may be poured over the fabric in amounts sufficient to saturate the same while

simply permitting excess solvent to drain off into a tray, or the solvent can be sprayed on the fabric. The saturation step can be carried out at ambient temperature and pressure and the excess, as mentioned above, simply permitted to drain off for a period of time sufficient to obtain a fabric saturated to functional equilibrium. Any other appropriate method of removing the excess solvent to obtain a fabric saturated to functional equilibrium can be used.

5 [0049] It is within the purview of an embodiment of the invention that the fabric strip be immersed or transported through a tank of appropriate solvent in a substantially horizontal direction either before or after, and preferably before, it has been wrapped on the core to form a roll. After saturation has taken place, the saturated fabric is preferably simply suspended in a position to permit excess solvent to drain off or run through two rollers and be collected in a tray for reuse.

10 [0050] Additionally, in accordance with a preferred embodiment of the method, the air content of the fabric must be reduced or eliminated. Any appropriate reduction of air content step may be employed. The preferred method of reducing the air content of the fabric is calendering. A fabric is calenderized by running it through at least a pair of rollers. The at least a pair of rollers compresses the fabric. Preferably, but not necessarily, the temperature of the pair of rollers is either hotter than room temperature or at or cooler than room temperature. A surprising and unexpected result of the removal

15 of the air content is that the length of fabric is increased while not increasing the diameter of the fabric roll.

20 [0051] The wrapping of the fabric on the elongated core to form a roll, as well as measured absorption and/or draining or other removal thereof, may also take place at ambient temperature and pressure. When the saturation of the fabric and wrapping of the fabric to form a fabric roll are completed, the fabric roll may be inserted in a sleeve. Preferably, the fabric roll is inserted in a heat-sealable and shrinkable plastic sleeve and the sleeve is heat-sealed and/or shrunk and heat-sealed at a temperature sufficient to heat-seal the sleeve around and in contact with the saturated, wrapped fabric roll. In this regard, the particular shrinking and heating-sealing temperature will be dependent upon the type of shrinkable and heat-sealable material utilized. Care must be taken, however, to be sure that the particular temperature employed is not so high that it will have a deleterious effect on the saturated fabric roll disposed in the plastic sleeve.

25 [0052] In general, heat-sealing can be achieved at temperatures in a range of from about 300°F. up to about 400°F., and preferably are achieved at temperatures in a range of from about 350°F. up to about 375°F. and may be carried out in an oven, or under heat-radiating lamps.

30 [0053] The sleeve will be sized so that the wrapped fabric roll can be inserted therein with facility and the open edges of the sleeve then brought together in con-

tact with each other in order to seal the same, while at the same time, being sized also so that if and when shrinking takes place, it will be brought into contact with the fabric roll around which it is disposed.

[0054] In those cases where the saturated, wrapped fabric roll is to be employed with a slotted canister 23, the roll is simply inserted in the canister 23 with a portion thereof protruding through the slot and the canister 23 is provided with a knock-out end portions which may be inserted therein after insertion of the roll, such end portions simply being removed when the roll is to be disposed on an appropriate shaft of a printing apparatus or the like in order to permit insertion of the shaft from the core. Moreover, the canister 23 may be made from metals, such as light gauge steel, aluminum and the like, or from cardboard or from plastic materials, such as polyethylenes, polyolefins, polyvinyl chlorides, polyamides, and the like.

[0055] In those instances where end caps, such as end caps 25, are employed in making the cleaning system employing a reduced air cleaning fabric, the end caps, which may be made of the same materials mentioned above for the canister 23, are simply inserted in the open ends of the core 11 after wrapping, saturation and removal of excess solvent of the method has been accomplished.

[0056] It is to be understood that within the context of this invention, the terminology "saturated to functional equilibrium" as it is used in connection with the saturation of the fabric and/or fabric roll with solvent means that after applying a measured amount of solvent or removing the excess solvent from the fabric and/or fabric roll, the fabric and/or fabric roll retains therein sufficient solvent or wetting agent in an amount to wet the fabric to the extent that it imparts efficient cleaning ability to the fabric to clean cylinders of apparatus, such as printing machinery, and the fabric has preferably retained therein after measured absorption or removal of the excess, if any removal is required, from about 0.02 cc to about 0.5 cc of solvent per in² of fabric.

[0057] In one embodiment, the so made cleaning system employing a reduced air content fabric of this invention can be employed on any printing apparatus simply by modifying the apparatus to provide it with at least one shaft which can be inserted through the open ends of the core. In a preferred embodiment, a single shaft is inserted through a hollow core. Additionally, the printing apparatus may be provided with a take-up roll which is employed to take up the used portion of the cleaning fabric after it has carried out its cleaning function. This is a distinct advantage of the cleaning system of this invention since it eliminates the need for complex apparatus, such as pumps, spray bars, manifold lines, valves and the like, especially as part of the automatic blanket cleaning systems used on printing machinery to introduce cleansing solvents or solutions to the cleaning fabric just prior to use.

[0058] In addition, the cleaning system of this inven-

tion provides numerous other advantages. For example, it is relatively simple in construction, employs readily available materials, and can be made in a relatively simple and forward manner without resort to highly complex and expensive procedures which necessitate the use of elaborate machinery. Additionally, the invention is an alternative to the invention discussed in U.S. Patent No. 5,368,157 to Gasparrini et al. in that it provides for less solvent displacement during storage and thus less of a

5 change in the fabric roll's center of gravity. Additionally, the use of a cleaning fabric with a reduced volume of air on the present and conventional systems not involving presoak techniques will have the advantage of having more fabric on a cleaning fabric supply roll of a given 10 diameter. Numerous other advantages of this invention 15 will be readily apparent to those skilled in the art.

[0059] It will remain understood by those skilled in the art that the present invention in its broader aspects is not limited to the particular embodiments shown and described herein, and that variations may be made which are within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

25

Claims

1. A packaged cleaning device for a cylinder of a printing press comprising a roll of porous sheet material (13) impregnated with a cleaning liquid in a closed container (15), characterised in that the sheet material has been mechanically compressed prior to impregnation with the cleaning liquid, so as to reduce its air content.
2. A device according to claim 1, wherein the sheet material (13) is wrapped around a core (11).
3. A device as claimed in claim 2, wherein the length of the sheet material (13) is at least about 25% greater than the length of non-air reduced sheet material having an equal diameter about the core.
4. A device as claimed in any preceding claim, wherein said core (11) comprises an elongate cylinder having open ends, the device further comprising end caps (25) located in the open ends of the core.
5. A device according to any preceding claim, wherein the cleaning liquid is present in the sheet material (13) in an amount sufficient to saturate the sheet material to functional equilibrium and the saturated sheet material is functional for cleaning the cylinders of a printing press.
6. A device as claimed in any preceding claim wherein the sheet material (13) is a cloth fabric.

7. A device as claimed in any one of claims 1 to 5, wherein the sheet material (13) comprises a mixture of wood pulp and polyester.

8. A device as claimed in any preceding claim wherein the thickness of the sheet material (13) has been reduced by between about 10% to about 50%. 5

9. A device as claimed in any preceding claim wherein the sheet material (13) has a reduced air content by volume by about 1% to about 50%. 10

10. A device as claimed in any preceding claim, wherein the sheet material retains from about 30 to 800cc per square metre (0.02 to about 0.5 cc of the cleaning fluid per square inch) of the sheet material

11. A device as claimed in any preceding claim, wherein the cleaning liquid comprises at least one low volatility cleaning compound which does not readily evaporate at ambient temperature and pressure and has a volatility in a range of from about zero to about 30%. 20

12. A device as claimed in any preceding claim, wherein the container comprises a sealed sleeve (15) disposed around and in contact with the sheet material (13), whereby the sheet material can be transported and stored vertically and horizontally until use without substantially disturbing the distribution of the solvent in the fabric and detrimentally affecting the cleaning ability of the sheet material. 25

13. A device as claimed in claim 12, wherein the sealed sleeve (15) is made of heat-sealable plastic material. 30

14. A device as claimed in claims 12 or 13, wherein the sealed sleeve (15) is heat-shrinkable. 35

15. A device according to any one of claims 12 to 14, wherein the sleeve is made of polyethylene, polyolefin, polyvinyl chloride or polyamide sheet material. 40

16. A device as claimed in any one of claims 12 to 15, further comprising a canister (23) disposed between the sheet material (13) and the sleeve (15). 45

17. A device for cleaning a cylinder of a printing press, as claimed in either claim 2 or 3 further comprising a means for positioning the sheet material (13) adjacent to a cylinder (56) to be cleaned. 50

18. A method of making a packaged device for cleaning a printing cylinder, comprising pre-soaking and saturating a porous sheet material with a low volatility, organic compound solvent which does not evaporate readily at ambient temperature and pressure, forming a roll (13) of the pre-soaked material, and packaging the roll in a closed container (15) characterized by compressing the sheet material, prior to the pre-soaking so as to reduce its air content. 55

19. A method as claimed in claim 18, wherein the packaging includes the step of sealing the container (15) around the roll, whereby the roll can be transported and stored vertically and horizontally until use without substantially disturbing the distribution of the solvent in the sheet material roll and detrimentally affecting the cleaning ability of the sheet material.

20. A method as claimed in claim 19, wherein the step of packaging comprises placing a sealable sleeve (15) around the wrapped, saturated sheet material roll and sealing the sealable sleeve around the wrapped, saturated sheet material roll. 20

21. A method as claimed in claim 20, further comprising subjecting the sealable sleeve to a vacuum and drawing the sealable sleeve into contact with the wrapped sheet material roll after disposing the wrapped sheet material roll in the sealable sleeve and before sealing the sleeve. 25

22. A method as claimed in any one of claims 18 to 21, wherein the strip of sheet material is wrapped about an elongate core (11) prior to soaking the strip of sheet material with the solvent. 30

23. A method as claimed in any one of claims 18 to 22, wherein the step of pre-soaking the strip comprises saturating the sheet material beyond equilibrium with excess solvent and removing the solvent so that the sheet material is in functional equilibrium. 35

24. A method as claimed in any one of claims 18 to 22, wherein the step of pre-soaking the strip comprises bringing a measured amount of the solvent in contact with the strip of sheet material and allowing the measured amount of solvent to be absorbed. 40

25. A method as claimed in claim 23, wherein the solvent is removed until the sheet material retains about 30 to 800 cm³ per m² (0.02 to about 0.5 cc of solvent per square inch) of the sheet material. 45

26. A method as claimed in any one of claims 18 to 25, wherein the step of reducing the amount of air comprises calendaring the sheet material. 50

27. A method as claimed in claim 26, wherein the step of reducing the amount of air is accomplished by reducing the thickness of the sheet material by between about 10% to about 50%. 55

28. A method as claimed in claim 26 or 27, including reducing the air content in the sheet material by between 1% to 50%.

29. A method as claimed in any one of claims 26 to 28, wherein the calendering includes increasing the length of the sheet material by at least about 25%.

30. A method as claimed in any one of claims 18 to 29, further comprising the steps of:

unwinding at least a portion of the sheet material from the sheet material roll (11);

placing said at least a portion (54) of the sheet material in contact with a cylinder (56) to be cleaned; and

taking-up said at least a portion of the sheet material on a take-up shaft (52).

7. Vorrichtung nach einem vorhergehenden Anspruch, worin das Bahnmaterial (13) in Gemisch von Holz-Zellstoff und Polyester umfasst.

5 8. Vorrichtung nach einem vorhergehenden Anspruch, worin die Dicke des Bahnmaterials (13) um einen Wert zwischen etwa 10 und etwa 50 % verringert worden ist.

10 9. Vorrichtung nach einem vorhergehenden Anspruch, worin das Bahnmaterial (13) einen um etwa 1 bis etwa 50 Vol.-% verringerten Luftgehalt aufweist.

15 10. Vorrichtung nach einem vorhergehenden Anspruch, worin das Bahnmaterial etwa 30 bis 800 cm³ Reinigungsflüssigkeit pro m² Bahnmaterial (0,02-0,5 cc/inch²) zurückhält (enthält).

Patentansprüche

1. Abgepackte Reinigungsvorrichtung für einen Zylinder einer Druckpresse, die eine Rolle aus porösem Bahnmaterial (13), das mit einer Reinigungsflüssigkeit imprägniert ist, in einem geschlossenen Behälter (15) umfasst,
dadurch gekennzeichnet, dass das Bahnmaterial vor dem Imprägnieren mit der Reinigungsflüssigkeit mechanisch komprimiert worden ist, um seinen Luftgehalt zu verringern.

2. Vorrichtung nach Anspruch 1, worin das Bahnmaterial (13) um einen Kern (11) herumgewickelt ist.

3. Vorrichtung nach Anspruch 2, worin die Länge des Bahnmaterials (13) um mindestens etwa 25 % größer ist als die Länge eines Bahnmaterials, dessen Luftgehalt nicht vermindert worden ist, mit einem gleichen Durchmesser um den Kern.

4. Vorrichtung nach einem vorhergehenden Anspruch, worin der genannte Kern (11) einen länglichen Zylinder mit offenen Enden sowie außerdem Endkappen (25), die in den offenen Enden der Kerns angeordnet sind, umfasst.

5. Vorrichtung nach einem vorhergehenden Anspruch, worin die Reinigungsflüssigkeit in dem Bahnmaterial (13) in einer Menge vorliegt, die ausreicht, um das Bahnmaterial bis zum funktionellen Gleichgewicht zu sättigen, und das gesättigte Bahnmaterial funktionsstüchtig ist zur Reinigung der Zylinder einer Druckpresse.

6. Vorrichtung nach einem vorhergehenden Anspruch, worin das Bahnmaterial (13) ein Stoffgewebe ist.

25 11. Vorrichtung nach einem vorhergehenden Anspruch, worin die Reinigungsflüssigkeit mindestens eine Reinigungsverbindung mit geringer Flüchtigkeit umfasst, die bei Umgebungstemperatur und Umgebungsdruck nicht leicht verdampft und eine Flüchtigkeit in dem Bereich von etwa 0 bis etwa 30 % aufweist.

30 12. Vorrichtung nach einem vorhergehenden Anspruch, worin der Behälter eine versiegelte Hülle (15) umfasst, die um diesen herum und im Kontakt mit dem Bahnmaterial (13) angeordnet ist, wodurch das Bahnmaterial bis zur Verwendung vertikal und horizontal transportiert und gelagert werden kann, ohne dass die Verteilung des Lösungsmittels in dem Gewebe im wesentlichen gestört wird, und ohne dass das Reinigungsvermögen des Bahnmaterials in nachteiliger Weise beeinflusst wird.

35 13. Vorrichtung nach Anspruch 12, worin die versiegelte Hülle (15) aus einem wärmeversiegelbaren Kunststoffmaterial besteht.

40 14. Vorrichtung nach Anspruch 12 oder 13, worin die versiegelte Hülle (15) wärmeschrumpfbar ist.

45 15. Vorrichtung nach einem der Ansprüche 12 bis 14, worin die Hülle aus einem Polyethylen-, Polyolefin-, Polyvinylchlorid- oder Polyamid-Folienmaterial hergestellt ist.

50 16. Vorrichtung nach einem der Ansprüche 12 bis 15, die außerdem eine zwischen dem Bahnmaterial (13) und der Hülle (15) angeordnete Patrone (23) umfasst.

55 17. Vorrichtung zum Reinigen eines Zylinders einer Druckpresse nach Anspruch 2 oder 3, die außerdem eine Einrichtung zur Positionierung des Bahn-

materials (13) benachbart zu einem zu reinigenden Zylinder (56) aufweist.

18. Verfahren zur Herstellung einer abgepackten Vorrichtung zum Reinigen eines Druckzylinders, das umfasst das Vorimprägnieren und Sättigen eines porösen Bahnmaterials mit einem organischen Verbindungs-Lösungsmittel mit geringer Flüchtigkeit, das bei Umgebungstemperatur und Umgebungsdruck nicht leicht verdampft, die Bildung einer Rolle (13) aus dem vorimprägnierten Material und das Verpacken der Rolle in einem geschlossenen Behälter (15),
dadurch gekennzeichnet, dass das Bahnmaterial vor dem Vorimprägnieren komprimiert wird, um seinen Luftgehalt zu verringern.

19. Verfahren nach Anspruch 18, worin das Verpacken die Stufe der Versiegelung des Behälters (15) um die Rolle herum umfasst, sodass die Rolle bis zur Verwendung vertikal und horizontal transportiert und gelagert werden kann, ohne dass die Verteilung des Lösungsmittels in der Bahnmaterialrolle im wesentlichen gestört wird, und ohne dass das Reinigungsvermögen des Bahnmaterials in nachteiliger Weise beeinflusst wird.

20. Verfahren nach Anspruch 19, worin die Stufe des Verpackens umfasst das Herumlegen einer versiegelbaren Hülle (15) um die herumgewickelte, gesättigte Bahnmaterialrolle herum und das Versiegeln der versiegelbaren Hülle um die herumgewickelte, gesättigte Bahnmaterialrolle herum.

21. Verfahren nach Anspruch 20, das außerdem umfasst das Anlegen eines Vakuums an die versiegelbare Hülle und das Inkontaktbringen der versiegelbaren Hülle mit der herumgewickelten Bahnmaterialrolle nach dem Anordnen der herumgewickelten Bahnmaterialrolle in der versiegelbaren Hülle und vor dem Versiegeln der Hülle.

22. Verfahren nach einem der Ansprüche 18 bis 21, worin der Streifen aus dem Bahnmaterial um einen länglichen Kern (11) herumgewickelt wird, bevor der Streifen des Bahnmaterials mit dem Lösungsmittel imprägniert wird.

23. Verfahren nach einem der Ansprüche 18 bis 22, worin die Stufe des Vorimprägnierens des Streifens umfasst das Sättigen des Bahnmaterials über das Gleichgewicht hinaus mit überschüssigem Lösungsmittel und das Entfernen des Lösungsmittels, sodass das Bahnmaterial im funktionellen Gleichgewicht ist.

24. Verfahren nach einem der Ansprüche 18 bis 22, worin die Stufe des Vorimprägnierens des Streifens

5 umfasst das Inkontaktbringen inerabgemessenen Menge des Lösungsmitts ls mit dem Streifen aus d m Bahnmaterial und das Absorbierenlassen der abgemessenen Lösungsmittelmenge.

10 25. Verfahren nach Anspruch 23, worin das Lösungsmittel entfernt wird, bis das Bahnmaterial etwa 30 bis 800 cm³ Lösungsmittel pro m² Bahnmaterial (0,02 - 0,5 cc/inch²) behält (enthält).

15 26. Verfahren nach einem der Ansprüche 18 bis 25, worin die Stufe der Verringerung der Luftmenge umfasst das Kalandrieren des Bahnmaterials.

20 27. Verfahren nach Anspruch 26, worin die Stufe der Verringerung der Luftmenge durchgeführt wird durch Verringern der Dicke des Bahnmaterials um etwa 10 bis etwa 50 %.

25 28. Verfahren nach Anspruch 26 oder 27, das umfasst die Verringerung des Luftgehaltes in dem Bahnmaterial um 1 bis 50 %.

30 29. Verfahren nach einem der Ansprüche 26 bis 28, worin das Kalandrieren umfasst die Erhöhung der Länge des Bahnmaterials um mindestens etwa 25 %.

35 30. Verfahren nach einem der Ansprüche 18 bis 29, das außerdem die Stufe umfasst:

40 Abwickeln mindestens eines Teils des Bahnmaterials von der Bahnmaterialrolle (11); Inkontaktbringen mindestens eines Teils (54) des Bahnmaterials mit einem zu reinigenden Zylinder (56); und Aufnehmen mindestens eines Teils des Bahnmaterials auf eine Aufnahmewelle (52).

Revendications

1. Dispositif emballé de nettoyage pour un cylindre d'une presse d'imprimerie comportant un rouleau en matière en feuille poreuse (13) imprégné d'un liquide de nettoyage dans un récipient fermé (15), **caractérisé en ce que** la matière en feuille a été comprimée mécaniquement avant l'imprégnation par le liquide de nettoyage, afin de réduire sa teneur en air.
2. Dispositif selon la revendication 1, dans lequel la matière en feuille (13) est enroulée autour d'un noyau (11).
3. Dispositif selon la revendication 2, dans lequel la longueur de la matière en feuille (13) est supérieure d'au moins environ 25 % à la longueur d'une matière

en feuille réduite, sans air, ayant un diamètre égal autour du noyau.

4. Dispositif selon l'une quelconque des revendications précédentes, dans lequel ledit noyau (11) comprend un cylindre allongé ayant des extrémités ouvertes, le dispositif comportant en outre des chapeaux d'extrémité (25) placés dans les extrémités ouvertes du noyau.

5. Dispositif selon l'une quelconque des revendications précédentes, dans lequel le liquide de nettoyage est présent dans la matière en feuille (13) en quantité suffisante pour saturer la matière en feuille à un équilibre fonctionnel et la matière en feuille saturée peut fonctionner pour nettoyer les cylindres d'une presse d'imprimerie.

6. Dispositif selon l'une quelconque des revendications précédentes, dans lequel la matière en feuille (13) est une étoffe de toile.

7. Dispositif selon l'une quelconque des revendications 1 à 5, dans laquelle la matière en feuille (13) comprend un mélange de pâte de bois et de poly-ester.

8. Dispositif selon l'une quelconque des revendications précédentes, dans lequel l'épaisseur de la matière en feuille (13) a été réduite d'environ 10 % à environ 50 %.

9. Dispositif selon l'une quelconque des revendications précédentes, dans lequel la matière en feuille (13) a une teneur en air réduite, en volume, d'environ 1 % à environ 50 %.

10. Dispositif selon l'une quelconque des revendications précédentes, dans lequel la matière en feuille retient d'environ 30 à 800 cm³ par mètre carré (0,02 à environ 0,5 cm³) du fluide de nettoyage par inch² de la matière en feuille.

11. Dispositif selon l'une quelconque des revendications précédentes, dans lequel le liquide de nettoyage comprend au moins un composé de nettoyage à faible volatilité qui ne s'évapore pas aisément à la température et à la pression ambiantes et à une volatilité dans une plage allant d'environ 0 à environ 30 %.

12. Dispositif selon l'une quelconque des revendications précédentes, dans lequel le récipient comprend un étui scellé (15) disposé autour de, et en contact avec, la matière en feuille (13), grâce à quoi la matière en feuille peut être transportée et stockée verticalement et horizontalement jusqu'à l'utilisation sans perturber sensiblement la répartition du solvant dans l'étoffe ni nuire à l'aptitude au nettoyage de la matière en feuille.

13. Dispositif selon la revendication 12, dans lequel l'étui scellé (15) est formé d'une matière plastique thermoscellable.

14. Dispositif selon la revendication 12 ou 13, dans lequel l'étui scellé (15) est thermorétractable.

15. Dispositif selon l'une quelconque des revendications 12 à 14, dans lequel l'étui est formé d'une matière en feuille constituée de polyéthylène, de polyoléfine, de polychlorure de vinyle ou de polyamide.

16. Dispositif selon l'une quelconque des revendications 12 à 15, comportant en outre une boîte (23) disposée entre la matière en feuille (13) et l'étui (15).

17. Dispositif pour nettoyer un cylindre d'une presse d'imprimerie, selon la revendication 2 ou 3, comportant en outre un moyen destiné à positionner la matière en feuille (13) à proximité immédiate d'un cylindre (56) devant être nettoyé.

18. Procédé de réalisation d'un dispositif emballé pour le nettoyage d'un cylindre d'imprimerie, comprenant une pré-imbibition et une saturation d'une matière en feuille poreuse avec un solvant constitué d'un composé organique à faible volatilité qui ne s'évapore pas aisément à la pression et la température ambiantes, la formation d'un rouleau (13) de la matière pré-imbibée, et l'emballage du rouleau dans un récipient fermé (15), caractérisé par la compression de la matière en feuille, avant la pré-imbibition, afin de réduire sa teneur en air.

19. Procédé selon la revendication 18, dans lequel l'étape d'emballage comprend l'étape consistant à sceller le récipient (15) autour du rouleau, grâce à quoi le rouleau peut être transporté et stocké verticalement et horizontalement jusqu'à l'utilisation sans perturber sensiblement la répartition du solvant dans le rouleau de matière en feuille ni nuire à l'aptitude au nettoyage de la matière en feuille.

20. Procédé selon la revendication 19, dans lequel l'étape d'emballage comprend la mise en place d'un étui scellable (15) autour du rouleau de matière en feuille saturée, enroulée, et le scellage de l'étui scellable autour du rouleau de matière en feuille saturée, enroulée.

21. Procédé selon la revendication 20, comprenant en outre le fait de soumettre l'étui scellable à une dépression et d'attirer l'étui scellable jusqu'en contact avec le rouleau de matière en feuille enroulée après

la mise en place du rouleau de matière en feuille enroulée dans l'étui scellable et avant l' scellage de l'étui.

22. Procédé selon l'une quelconque des revendications 5
18 à 21, dans lequel la bande de matière en feuille est enroulée autour d'un noyau allongé (11) avant l'imbibition de la bande de matière en feuille avec le solvant.

10

23. Procédé selon l'une quelconque des revendications 18 à 22, dans lequel l'étape de pré-imbibition de la bande comprend la saturation de la matière en feuille au-delà d'un équilibre avec un solvant excédentaire et l'élimination du solvant afin que la matière en feuille soit en équilibre fonctionnel. 15

24. Procédé selon l'une quelconque des revendications 18 à 22, dans lequel l'étape de pré-imbibition de la bande comprend le fait d'amener une quantité dosée de solvant en contact avec la bande de matière en feuille et de permettre à la quantité dosée de solvant d'être absorbée. 20

25. Procédé selon la revendication 23, dans lequel le solvant est éliminé jusqu'à ce que la matière en feuille retienne environ 30 à 800 cm³ par m² (0,02 à environ 0,5 cm³ de solvant par inch²) de la matière en feuille. 25

30

26. Procédé selon l'une quelconque des revendications 18 à 25, dans lequel l'étape de réduction de la quantité d'air comprend le calandrage de la matière en feuille. 35

27. Procédé selon la revendication 26, dans lequel l'étape de réduction de la quantité d'air est exécutée en réduisant l'épaisseur de la matière en feuille d'entre environ 10 % et environ 50 %. 40

28. Procédé selon la revendication 26 ou 27, comprenant la réduction de la teneur en air dans la matière en feuille de 1 % à 50 %.

29. Procédé selon l'une quelconque des revendications 45
26 à 28, dans lequel le calandrage comprend l'augmentation de la longueur de la matière en feuille d'au moins environ 25 %.

30. Procédé selon l'une quelconque des revendications 50
18 à 29, comprenant en outre les étapes dans lesquelles :

on déroule au moins une partie de la matière en feuille du rouleau (11) de matière en feuille ; 55
on place ladit , au moins une, parti (54) de la matière en feuil en contact avec un cylindre (56) devant être nettoyé ; et

on reçoit ladite, au moins une, partie de la matière en feuille sur un arbre récepteur (52).

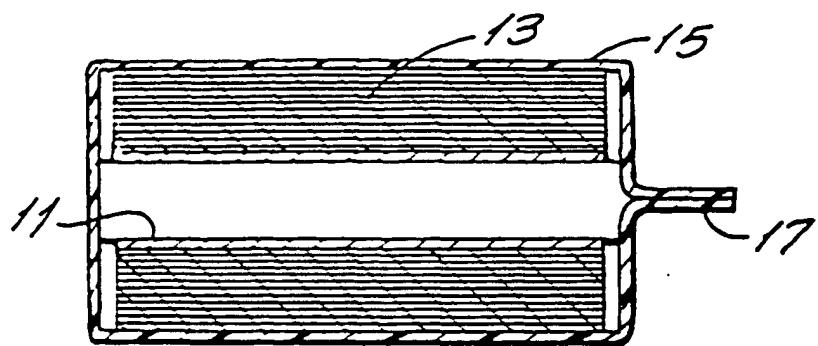
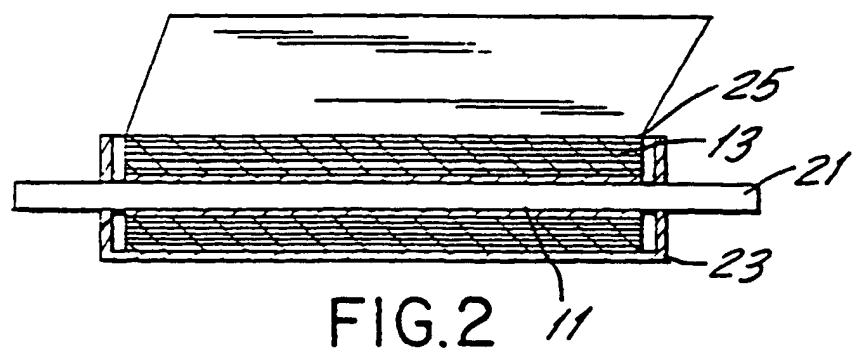


FIG. I



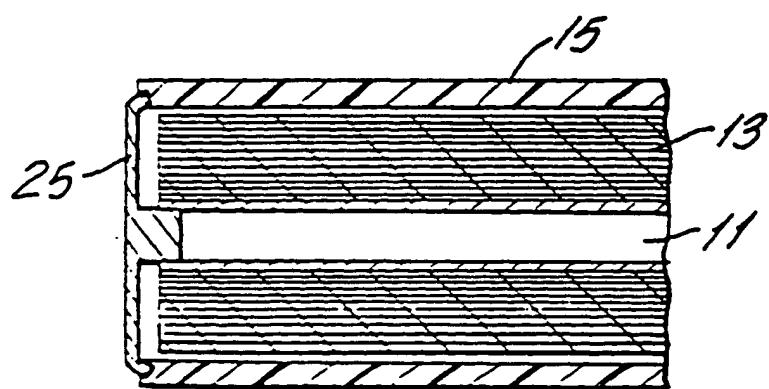


FIG.3

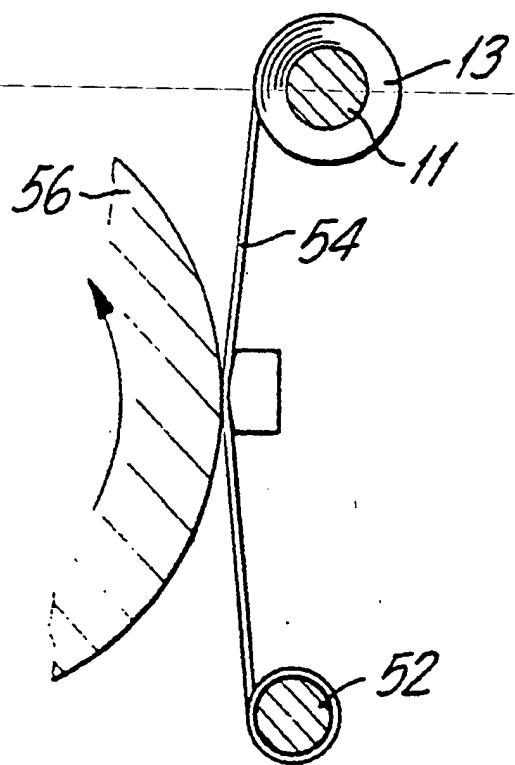


FIG.5